

# Nanostructured Humidity Sensor for Spacecraft Life Support Systems, Phase I

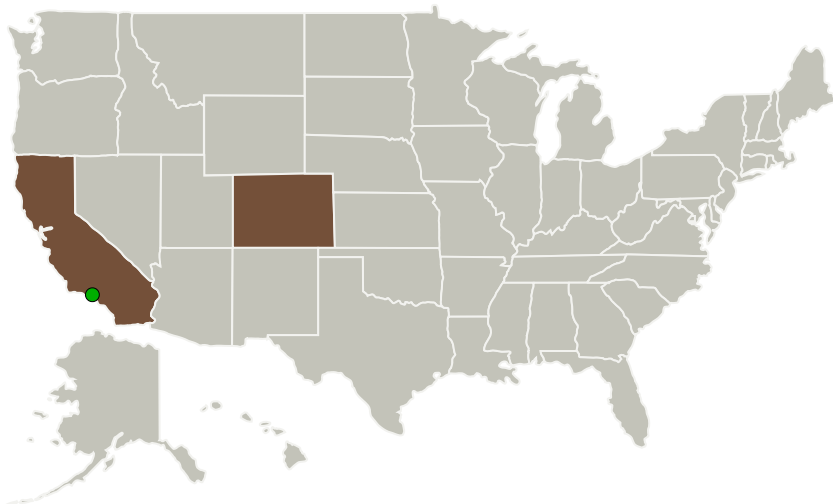
Completed Technology Project (2011 - 2011)



## Project Introduction

Humidity is a critical variable for monitoring and control on extended duration missions because it can affect the operation and efficiency of closed loop life support systems. Humidity sensors are needed for real-time process control over the critical O<sub>2</sub>, H<sub>2</sub>, and CO<sub>2</sub> gas streams in the system. Sensors with the right combination of performance, size, low power consumption, and durability for this application are not available. Synkera proposes to develop an advanced microsensor for humidity, which takes advantage of an innovative combination of nanomaterials and ceramic MEMS technology to meet the need for reliable and accurate humidity process control sensors for spacecraft. In Phase I, we will demonstrate the feasibility of integrating the elements described above to prepare a stable and accurate sensor, which will advance the technology from TRL 3 to 4. Then, in Phase II and beyond, we will work with an ECLSS prime contractor to develop space-qualified prototypes that are commercially viable for NASA and third-party applications and to integrate these sensors within NASA's closed loop life support systems.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Synkera Technologies, Inc.	Lead Organization	Industry	Longmont, Colorado
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Colorado

## Project Transitions

**February 2011:** Project Start**September 2011:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138343>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Synkera Technologies, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

Carlos Torrez

### Principal Investigator:

Jim Smith

### Co-Investigator:

James D Smith

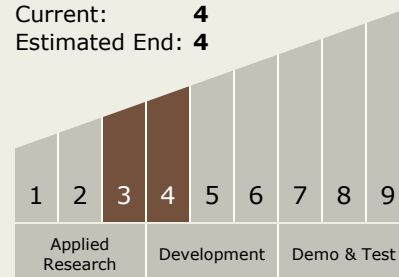
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## Technology Maturity (TRL)

Start: **3**  
Current: **4**  
Estimated End: **4**



## Technology Areas

### Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - └ TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - └ TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System